

REMARKS

This amendment is in response to the first office action mailed January 7, 2005. In the first Office Action, the Examiner rejected claims 1, 4, 5, 16, 17, 20 and 21 as being anticipated by Ingino, Jr. U.S. Patent No. 6,566,970. Claims 8-11 were rejected as being unpatentable over Ingino, Jr. '970 in view of Sahota U.S. Patent No. 5,880,631. Claims 2, 3, and 19 were rejected over Ingino, Jr. in view of Ciccarelli et al. U.S. Patent No. 6,175,279. Claims 12 and 13 were rejected as being unpatentable over Ingino, Jr. '970 in view of Sahota '631 and further in view of Ciccarelli '279. Claims 6, 7, 22 and 23 were rejected over Ingino, Jr. '970 in view of Ochiai Patent Publication No. US 2002/0014925. Claims 14 and 15 were rejected as being unpatentable over Ingino, Jr. '970 in view of Sahota '631 as applied to claims 8-11 above, and further in view of Ochiai '925. Finally, claim 18 was objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form. By this amendment claims 1, 8, and 16 have been amended and claims 17 and 18 canceled. Claims 1-16 and 19-23 remain pending in the application.

The present invention is directed to a voltage controlled oscillator (VCO) for use in a personal area network synthesizer that includes a delay cell (100), a first current amplifier (201, 203) for amplifying an input current, a resistor capacitor (RC) tuning network (207, 209, 211) for varying the amount of amplification and delay of an output of the first current amplifier. A second current amplifier (213, 215) is then used for amplifying an output current from the RC tuning network. The invention includes a unique composite voltage variable capacitor (300) for precisely tuning the amount of delay presented by the delay cell. The unique topology of the delay cell (100) allows it to be readily used in VCOs operable at frequencies above 1GHz.

The Examiner has primarily relied on Ingino, Jr. which teaches a VCO operating over a wide operating range that has a ring oscillator with power supply that is controlled in response to the VCO's control voltage input. An inverter is coupled to the ring oscillator's output and is also supplied with a power supply controlled by the control input voltage. Working together, the output of the ring oscillator and output of the inverter closely approximate a differential signal. Apparently, Ingino, Jr. was cited to show the use of a current amplifier.

The other references cited by the Examiner, namely, Sahota, Ciccarelli et al., and the Ochiai publication, were cited in combination with Ingino, Jr. against Applicants' dependent claims to show that it would have been obvious to provide a plurality of current amplifiers, a filter function for the bias network or to replace the variable capacitance elements with VVCs. Applicants note with appreciation the Examiner's objection to the subject matter in claim 18, where the current amplifier includes a first current amplifier at an input of the VCO delay cell and a second current amplifier at an output of the VCO delay cell. In order to further the prosecution of this application, Applicants have now amended claims 1, 8, and 16 to include these limitations. Since the prior art of record neither teaches nor suggests an invention as defined by these claims, claims 1, 8 and 16 and all claims depending therefrom should now be in condition for allowance and an early notice thereof is respectfully requested. Should the Examiner have any comments or suggestions that would expedite the allowance of this application, he is respectfully requested to telephone the undersigned.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. Moreover, no amendment made was for the purpose of narrowing the scope of any claim unless Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

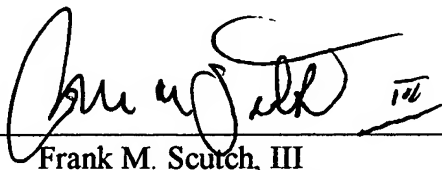
Please charge any additional fees associated with this amendment and credit any overpayments to Deposit Account No. 50-0223. A duplicate original of this sheet is enclosed.

Respectfully submitted,

Dated: 3/29/2005

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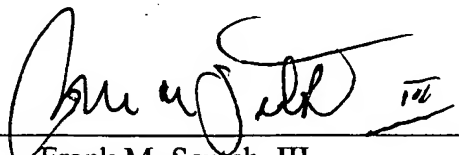
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